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10/057,274

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Michael D. Schaff

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07/16/2004

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EXAMINER

FIGUEROA, NATALIA

ART UNIT

PAPER NUMBER

2651

DATE MAILED: 07/16/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,274

Applicant(s)

SCHAFF ET AL.

Examiner

Natalia Figueroa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-28 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 08 March 2002 (Paper No. 2) is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 4, 6 and 21-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Baker (USPN 6,373,647).

Regarding claim 1, Baker discloses a disc drive having a plurality of tracks and a magneto resistive (MR) head positioned above the tracks to access magnetic information stored on the tracks (abstract and col. 1, lines 13-19), and a thermal asperity detector circuit operably connected to the MR head (col. 4, lines 59-64), a method of detecting and measuring instability within the MR head (abstract and col. 4, lines 49-52) comprising steps of setting a threshold in the thermal asperity detector operably connected to the MR head (col. 7, lines 6-25), applying a read bias to the MR head (col. 2, lines 13-19); reading a signal emanating from the MR head positioned over an erased track (col. 6, lines 53-57); a counting a number of occurrences of signals that exceed the threshold (col. 6, lines 66-67); and determining transducer magnetic

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instability for the MR head based on the number of occurrences of signals that exceed the threshold (col. 7, lines 6-42).

Regarding claim 4, Baker further discloses realigning magnetic domains within the MR head if the number of signal occurrences exceeds a pre-determined number (fig. 3, 311 and col. 6, lines 38-43).

Regarding claim 6, Baker discloses a method for detecting transducer magnetic instability in a magneto-resistive (MR) head in an operating disc drive (abstract and col. 4, lines 49-52), the method comprising steps of setting a signal threshold in a thermal asperity detector in a disc drive read channel circuit (col. 4, lines 59-64 and col. 7, lines 6-25); setting a read bias in the read channel circuit (col. 2, lines 13-19); reading an erased track on a disc in the drive to detect a signal emanating from the MR head (col. 6, lines 53-57); and counting an occurrence of the signal if the signal exceeds the signal threshold (col. 6, lines 66-67).

Regarding claim 21, Baker discloses an apparatus for detecting and measuring instability in a magneto-resistive (MR) head in an operating disc drive (abstract and col. 4, lines 49-52), the MR head having a magnetic orientation and positioned over a pre-determined track on a disc in the drive (col. 2, lines 13-19), the apparatus comprising a thermal asperity detector circuit in a read channel of the disc drive operably connected to the MR head, the thermal asperity detector having an adjustable threshold set to a pre-determined value; and a means for utilizing the thermal asperity detector circuit to determine magnetic instability (abstract; and col. 4, lines 59-64 and col. 7, lines 6-25).

Regarding claim 22, Baker further discloses a read bias applied to the MR head, the bias selected from a range of values, the values based on the MR head resistance to a magnetic field

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(col. 2, lines 13-19); and a signal generated by the MR head, the MR head positioned over an erased track (col. 6, lines 53-57).

Regarding claim 23, Baker further discloses means for adjusting the bias to re-orient the magnetic domains within the MR head based on the number of occurrences of signals exceeding the pre-determined threshold value (fig. 3, 311 and col. 6, lines 38-43).

Regarding claim 24, Baker further discloses a software module operably connected to the thermal asperity detector comparing a signal from the MR head to the pre-determined threshold (fig. 2 and col. 4, lines 59-64), the MR head positioned over an erased track (col. 6, lines 53-57), the software module counting occurrences in which the signal exceeds the pre-determined threshold value (col. 6, lines 66-67).

Regarding claim 25, Baker further discloses means for generating a signal by the MR head, the MR head positioned over an erased track (col. 6, lines 53-57); and a means for comparing the signal to the pre-determined threshold, counting occurrences in which the signal exceeds the pre-determined threshold value (col. 6, lines 53-67).

Regarding claim 26, Baker further discloses that the software module further comprises a comparator operably connected to the read channel comparing the signal from the MR head to the pre-determined threshold value; and a counting unit operably connected to the comparator counting occurrences in which the signal exceeds the pre-determined threshold value (col. 3, line 64-col. 4, line 5 and col. 4, lines 59-66).

Regarding claim 27, Baker further discloses that the thermal asperity detector is operably connected to the MR head via a pre-amplifier and the software module is operably connected to

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the thermal asperity detector via the pre-amplifier (col. 3, line 64-col. 4, line 5 and col. 7, lines 25-33).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 2- 3, 5, 7-9, 11-12, 16-19 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker and Fioravanti et al (USPN 6,483,657).

Regarding claims 2 and 3, Baker discloses the steps of reading, counting and determining (col. 6, lines 53-67 and col. 7, lines 6-33). Baker fails to teach adjusting the read bias to a new value within a range of values, the range of values based on a characteristic of the MR head; and re-setting the thermal asperity detector to a new threshold.

However, Fioravanti et al disclose such on (col. 6, lines 63-65). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify

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the apparatus as disclosed by Baker with the above teachings from Fioravanti et al to include the selection of appropriate values for the thresholds in order to optimize the functioning of the MR head, hence allowing the reading and writing of a signal to occur with minimum errors.

Regarding claim 5, apparatus claim 5 is drawn to the apparatus corresponding to the method of using same as claimed in claim 4. Therefore apparatus claim 5 corresponds to method claim 4, and is rejected for the same reasons of obviousness as used above.

Regarding claim 7, Baker and Fioravanti are relied upon for the same reasons of rejection as stated above. Claim 7 has limitations similar to those treated in the above rejections, and is met by the references as discussed above.

Regarding claim 8, Baker fails to teach performing the re-setting and repeating steps for a pre-determined number of repetitions. However, Fioravanti et al disclose such on (figs. 5 and 7; and col. 8, lines 3-17).

Regarding claim 9, Baker fails to teach performing the re-setting and repeating steps until there are no occurrences of signals that exceed the threshold. However, Fioravanti et al disclose such on (figs. 5 and 7; and col. 8, lines 24-33).

Regarding claims 11 and 12, Baker and Fioravanti are relied upon for the same reasons of rejection as stated above. Claims 11 and 12 have limitations similar to those treated in the above rejections, and are met by the references as discussed above.

Regarding claims 16 and 17, Baker fails to teach attenuating and amplifying the signal emanating from the MR head to a level within a range of pre-determined signal thresholds. However, Fioravanti et al disclose such on (col. 4, lines 6, lines 61-67).

Regarding claims 18 and 19, apparatus claims 18 and 19 are drawn to the apparatus corresponding to the method of using same as claimed in claims 8 and 11. Therefore apparatus claims 18 and 19 correspond to method claims 8 and 11, and are rejected for the same reasons of obviousness as used above.

Regarding claim 28, Baker fails to teach means for adjusting the signal emanating from the magneto-resistive head, the adjustment attenuating/amplifying the signal to a level within the range of settings for the threshold. However, Fioravanti et al disclose such on (col. 4, lines 6, lines 61-67).

4. Claims 13-15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker and Fioravanti et al and further in view of Reed et al (USPN 6,038,091).

Regarding claim 13, Baker and Fioravanti et al are relied upon for the same reasons of rejection as stated above. Baker and Fioravanti et al fail to teach setting a first criterion based on a characteristic of the MR head; comparing the counted number of occurrences of the signals that exceed the threshold to the first criterion to determine a reliability value to the MR head. However, Reed et al disclose such on (abstract, fig. 4 and col. 4, lines 54-63).

Regarding claim 14, Baker and Fioravanti et al are relied upon for the same reasons of rejection as stated above. Baker and Fioravanti et al fail to teach rejecting the-MR head if the reliability value is outside a second criterion. However, Reed et al disclose such on (abstract, fig. 4 and col. 4, lines 34-44).

Regarding claim 15, Baker further discloses re-aligning magnetic domains within the MR head based on the reliability value (fig. 3, 311 and col. 6, lines 38-43).

Regarding claim 20, apparatus claim 20 is drawn to the apparatus corresponding to the method of using same as claimed in claim 13. Therefore apparatus claim 20 corresponds to method claim 13, and is rejected for the same reasons of obviousness as used above.

Allowable Subject Matter

5. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following documents are cited to further show the state of the art with respect to in-situ detection of transducer magnetic instability in a disc drive.

a. Armstrong et al (USPN 5,701,314), which discloses thermal asperity detection and thermal asperity erasure pointers.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Figueroa whose telephone number is (703) 305-1260. The examiner can normally be reached on Monday - Thursday 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (703) 308-4825. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AFm
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